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ABSTRACT

The study investigated whether a significant relationship existed between the continuous length of time a student spends at one school and reading and arithmetic achievement test scores. The study population consisted of all 6th grade students in a single school located within 25 miles of Phoenix (Arizona) and within 10 miles of an Air Force complex. The literature review, using only studies written after 1959, showed that there was no significant relationship between mobility and achievement. A total of 132 students who were present when the California Achievement Test (CAT) was administered in October 1973 were included in the testing. If a student was present for the testing, but subsequently moved, his scores were still included. A causal-comparison design was used, with continuous length of time as the independent variable and mean grade equivalent achievement test scores as the dependent. Analysis of variance was used to determine if differences existed at the .05 level of significance for 4 CAT subtests: Reading Vocabulary, Reading Comprehension, Mathematics Computation, and Mathematics Concepts and Problems. The study concluded that, since the f-ratios were not sufficient to establish significance at the .05 level, length of continuous attendance did not significantly affect achievement test scores. (KM)

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A STUDY OF THE RELATIONSHIP OF THE LENGTH OF CONTINUOUS ATTENDANCE AT A SINGLE SCHOOL TO READING AND ARITHMETIC ACHIEVEMENT TEST SCORES

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PREFACE

Each year, many families are forced to move to a new residence. Parents often question whether or not moving affects their children in school adversely. This study attempts to analyze this problem of mobility in relation to achievement in another way -- to consider the student's length of attendance at one school, rather than the number of moves the student has made.

The author wishes to thank H. V. Wingfield for permission to use the achievement test scores.

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CHAPTER I

INTRODUCTION

Statement of the Problem

During the 1968-69 school year, an estimated 2.7 million pupils entered public elementary schools after fall, 1968, either for the first time or after having been enrolled in another school.(18:3) Nearly 2.5 million pupils left public elementary schools during the same school year.(18:3) The U. S. Census Reports of 1970 showed that over 53% of the people in Arizona changed residence in 1970, either within the state or out of state.(28:316) Vance Packard states, "Mobility as a major cause of social fragmentation in America obviously has some sort of impact on the millions of youngsters who find themselves being moved to a new locality each year."(20:22) It is reasonable to suppose that mobility, as a factor, can influence attitudes, interest, and consequently, achievement.

Every year, achievement tests are administered in many school districts. The school districts then use the test scores as an indicator in many ways; scores are used to compare schools, school districts, various programs, and various physical formats. The scores of all students present on the day of testing are usually included, regardless of the length of time a student has attended the school. Considering the extent to which test scores are used in evaluation, it is necessary to examine the relationship between the continuous length of time a student spends at one school and achievement

test scores.

Purpose of the Study

The purpose of this study was to determine if a significant relationship exists between the continuous length of time a student spends at one school and reading and arithmetic achievement test scores.

Statement of Hypotheses

1. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Reading Vocabulary.
2. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Reading Comprehension.
3. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Total Reading.
4. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Mathematics Computation.
5. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Mathematics Concepts and Problems.
6. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Total Mathematics.

Assumptions

It was assumed that the following elements did not affect the results of this study significantly:

1. Sex differences - of the sample of 132 students, 68 were male and 64 female.
2. Ability differences - with the size of the sample, it was accepted that a normal distribution of ability was obtained.
3. Types of instructional program - a variety of instructional programs were employed throughout the grades at the single elementary school. Therefore, it seems reasonable to conclude that any possible differences due to types of programs were distributed randomly throughout the sixth grade population.
4. Chronological age - with the size of the sample and the age span of 10 to 13, it was assumed that a normal distribution of chronological age was obtained.
5. Retentions - since it was not possible to determine the number of retentions for all students within the population, the groups could not be compared on this variable.
6. Sample - the sample included 122 Anglos, 3 Blacks, 6 Spanish surname, and 1 Oriental. It was assumed that the small number of minority students were distributed randomly throughout the sixth grade sample.
7. Socio-economic status - with the size of the population and the geographic location of the single school, it was assumed that a normal distribution of socio-economic status

was obtained.

Definition of Terms

The following terms were used throughout this study:

1. Cut-off date - the use of November 1, as a cut-off date, was arbitrarily selected since the students enrolled as of that date benefited from approximately seventy percent of the instructional program. The following cut-off dates were established:

   Group 1 - consists of all sixth grade students who were continuously enrolled as of November 1, 1968.

   Group 2 - consists of all sixth grade students who were continuously enrolled as of November 1, 1970.

   Group 3 - consists of all sixth grade children who were continuously enrolled as of November 1, 1972.

   Group 4 - consists of all sixth grade students who were continuously enrolled less than one full year.

2. Length of continuous attendance - the length of time a student was enrolled at a single school without withdrawing for any reason.

3. Entrance date - the recorded date for which a student legally enrolled and entered the single school.

4. Reading Vocabulary - the section of the California Achievement Tests that measures how well a student knows the meaning of words.(8:7)
5. Reading Comprehension - the section of the California Achievement Tests that tests the relationships, inferences, recall of facts, and identification of main ideas.(8:7)
6. Total Reading - includes both Reading Vocabulary and Reading Comprehension sections of the California Achievement Tests.
7. Mathematics Computation - the section of the California Achievement Tests that measures the student's ability to add, subtract, multiply, and divide whole numbers and fractions.(8:7)
8. Mathematics Concepts and Problems -
    a. Concepts - the section of the California Achievement Tests which measures, "... the student's understanding and use of mathematics concepts in a variety of contexts."(8:7)
    b. Problems - the section of the California Achievement Tests which is, "... designed to measure the student's ability to comprehend and correctly answer a variety of word problems ranging from those which involve basic one-step operations to those which involve percentages and averages."(8:8)
9. Total Mathematics - includes both Mathematics Computation and Mathematics Concepts and Problems sections of the

California Achievement Tests.

10. Grade equivalents - "The grade equivalents for a particular raw score represents the year and month of school, i.e., grade level for which that raw score is the median."(8:44)

Limitations

Since the sample under consideration was drawn from the total sixth grade population in a single school, the results of this study can be generalized only to that sixth grade population. The results may or may not be typical of other sixth grades within the school district.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The mobile child has been considered a serious problem in many schools. Teachers responding to a questionnaire in a study by Warner(29) tended to view the mobile student as comparing unfavorably to their other students in attendance, ability, achievement, and attitude toward school. Calvo stated that, "The mobile child ... is clearly a rather serious problem and one that is probably on the increase."(5:487) In an article written in Today's Education, Vance Packard stated, "Family mobility is only one of several factors which undermine community life in modern society and have a negative impact on youngsters."(20:27) Ample studies have been made to establish whether or not a relationship does in fact exist between student mobility and achievement, also involving other variables such as intelligence quotient, socio-economic status, attitude, and sex. Some researchers have concluded that mobility had an adverse effect on achievement, while others found that achievement was positively affected by mobility. The majority of studies examined, however, showed that mobility had no significant relationship to student achievement.

Studies Showing an Adverse Effect of Mobility on Achievement

In a study of the relationship of mobility to academic self-concept and academic achievement of sixth grade children, Weatherman(30:2357-8A) concluded that mobility did influence achievement; however, this was in specific subjects and mainly with boys. Boys who made up the mobile group scored significantly lower in the four critical academic subject matter fields as measured by the Sequential Tests of Educational Progress: Reading, Writing, Social Studies, and Mathematics. Sixth grade girls in the mobile group were not affected. Achievement for both boys and girls in Science was affected by moving. It was also indicated that there was a significantly lower socio-economic index and a significantly lower education for fathers for the sixth grade pupils who had moved three or more times.

Frazier examined the relationships of local pupil mobility to reading achievement and intelligence test results of educationally disadvantaged, using a population of mobile and non-mobile students enrolled in the sixth grade of eighteen Target Area elementary schools in Denver, Colorado.(12:1508-9A) Cumulative records were examined and information including Kuhlman-Anderson I.Q. scores and grade level scores of the Stanford Achievement Tests was recorded at grades three and five. The t-test was used to compare reading achievement and intelligence test results, while analysis of variance was used in exploring the relationship of test results to frequency and

grade level moves. At the third and fifth grade level, Frazier found that there was a significant difference in reading achievement, as measured by the mean grade level scores in word meaning and paragraph meaning, between the mobile and non-mobile disadvantaged child, favoring the non-mobile group. Also at the third and fifth grade level, there was a significant difference in mean I.Q. scores between the mobile and non-mobile group, again favoring the non-mobile group. There was also no difference in mean reading achievement and I.Q. scores of locally mobile disadvantaged children who had moved the same number of times.

Studies Showing a Positive Effect of Mobility on Achievement

Studies by Snipes(23) and Evans(9) showed positive relationships between mobility and achievement. The study by Snipes was designed to test differences between pupils who had moved and those who had remained in continuous residence on certain selected variables of reading achievement.(23:242-46) Personal data on 483 sixth grade pupils in Georgia was obtained. Reading achievement was measured by the reading section of the California Achievement Tests, Form W. Intelligence quotients and social status were also obtained for each pupil from the California Short-Form Test of Mental Maturity and a Personal Data Form constructed by the investigator. The results obtained from using analysis of variance, indicated that the moving pupils achieved better success in reading vocabulary and reading comprehension.

Pupils who had experience in various schools and who lived in other states and countries tended to be favored in reading achievement over non-movers. Snipes concluded that the number of moves pupils made did not appear to have detrimental effects upon reading achievement — rather, moving strengthened reading achievement.

In Evans' study of the effect of pupil mobility upon academic achievement, 97 fifth and sixth grade pupils' cumulative record cards were studied and letter grades for Reading, Social Studies, Arithmetic, and Science were converted to number grades.(9:18-22) Mean and median achievement scores were determined after it was established that there was no significant difference in the abilities of the mobile and non-mobile groups. The mobile group consistently outscored the non-mobile group in achievement as measured by the mean and median scores. The was no significant differences between the two groups according to standard deviation. Small differences were indicated by the averaged correlation scores. From these findings, Evans concluded that mobility did not have an adverse effect upon the academic achievement of the students; the mobile students showed a definite ability to adjust and outscore the non-mobile group.

Studies Showing No Significant Relationship Between Mobility and Achievement

The majority of studies examined showed that mobility

had no significant relationship to student achievement. In a study by Gilchrist(14:497A), sixth graders were tested using the Otis Quick-Scoring Mental Abilities Tests, Beta Tests, Form EM, and the Metropolitan Achievement Tests, Form BM, to determine the relationship between geographic mobility and achievement in reading and arithmetic. The findings indicated that there were no significant differences in the adjusted mean scores in reading and arithmetic for mobile and non-mobile students, except for the subtest word knowledge in which the mobile group which had changed schools three or more times achieved significantly lower adjusted mean scores, at the .05 level of significance. Gilchrist also found that there were no significant differences in the adjusted mean scores in reading and arithmetic according to sex or ability, and the number of times a child changed school did not appear to be related to academic achievement. The same investigation indicated that the occupational level and educational status of the head of the household appeared to be related significantly to academic achievement as measured by the Index of Social Position. Bollenbacher, working with sixth graders, also concluded that achievement in reading and arithmetic, as measured by the Stanford Intermediate Reading and Arithmetic Tests, was not affected by mobility.(3:356-360)

In a study by Carpenter(6:1740A) to investigate and compare the reading ability of mobile students and non-mobile students, fourth graders were administered the Stanford

Diagnostic Reading Test, Level I, Form W. The groups were identified as mobile or non-mobile, and then subdivided into male mobile students, male non-mobile students, female mobile students, and female non-mobile students. Raw score means for each subtest for each group were computed and comparisons were made using a t-test. The results indicated that the reading ability of non-mobile students did not differ significantly from the reading ability of mobile students except for the superiority of the non-mobile male students in the area of syllabication.

Using a teacher questionnaire, Swanson studied the problems of transfer students in the elementary school.(27:92) Pupils in grades one through six were grouped as transfer students (control group) and non-transfer students (experimental group). Comparability was further controlled since for each experimental subject, a control subject was randomly chosen under the conditions that the subject was of the same sex, from the same classroom, and a non-transfer student. Teachers indicated whether or not each subject had academic, social, or behavior problems. When asked if the subject had academic problems, teachers reported that 40% of the experimental subjects and 32.5% of the control subjects had academic problems. This difference was not significantly greater than chance. Concerning social problems and behavior problems, teachers reported that 42.5% of the experimental group and 7.5% of the control subjects had social problems, and 42.5%

of the experimental subjects and 20.0% of the control subjects had behavior problems, both significant beyond the .005 level of significance.

Black(2), Harris(15), and Saperstein(22) all examined mobility and achievement using students from low-income, Title I, or inner city areas, and concluded that there was no significant relationship between mobility and pupil achievement of their samples. Two hundred and ten sixth grade pupils in selected high-mobility-low-income elementary schools were used by Black to determine the relationship between pupil mobility and reading achievement.(2:21) Analysis of covariance was used to adjust the mean achievement scores from the California Comprehensive Reading Test and I.Q. and, analysis of variance was used to analyze the adjusted mean scores from the reading achievement catagories of mobility and sex. There were no significant differences at the .05 level of significance between the mobile and stationary pupils and among mobile pupils.

Harris investigated school mobility and its relationship to reading and arithmetic skills for Black and Chicano students using 406 sixth graders from selected Title I schools within Region 2.(15:4620-1A) Using Chi-Square values, he found that there were no significant relationships between reading and arithmetic levels with respect to the number of moves, sex, age, race, parents' education level, and teacher attitude. Harris did, however, find significant relationships

between arithmetic levels and I.Q. and home background. Saperstein (22:5514-5A) found that no significant relationship existed between pupil mobility and pupil achievement in reading and arithmetic, using the t-test, when 127 sixth graders from an inner city section were tested with the Metropolitan Achievement Test in reading and the mathematics section of the Iowa Basic Skills Test.

In a study to determine whether academic achievement of sixth grade students was influenced by the rate and type of school change experienced, Miller compared achievement scores of mobile and non-mobile students from ten schools in neighborhoods identified as culturally disadvantaged and middle socio-economic.(19:3231-2A) Each mobile student was matched according to school records by I.Q. and sex with a non-mobile student. The mean scores from the seven subtests of the Stanford Achievement Battery were then compared using t-tests. No significant differences were found at the .05 level of significance between the mean scores of mobile and non-mobile matched student groups in the culturally disadvantaged schools on forty-seven of forty-nine comparisons. The differences occurred in Arithmetic Applications, favoring the non-mobile students, and in Paragraph Meaning, favoring the very high mobile students. In the middle socio-economic schools, significant differences were found between the scores of the mobile and non-mobile students in the subtests of Language and Arithmetic Concepts when the students were grouped according

to migrant mobility, high mobility, and total mobility, favoring the latter. Miller concluded that mobility did not play a significant role in the academic achievement of culturally disadvantaged students, and the influence of mobility on sixth grade students in middle socio-economic schools seemed limited to Language and Arithmetic Concepts.

Cramer and Dorsey(7), Holcombe(16), Stiles(26), and Burget(4) did studies involving children of military personel. Three hundred sixty-six sixth grade children, many of whom were children of enlisted Air Force personel, were chosen for the Cramer-Dorsey study to investigate if mobility had an adverse effect on reading achievement; the Lorge-Thorndike Intelligence Tests were administered to determine I.Q. and the California Reading Test was administered to test for reading achievement.(7:387-90) Although it was found that age and intelligence quotient were significant contributors to reading achievement, no significant difference, as indicated by analysis of variance, were apparent between the permanent students and the mobile students. It is interesting to note that the scores for the children of Air Force personel were slightly, although not significantly, higher than the scores of the less mobile classmates; thus, Cramer and Dorsey state that mobility may contribute to reading proficiency.

Holcombe(16:2253-4A), using 263 sixth grade students and 183 ninth grade students from a large Army and Air Force complex, found no significant relationships between student

mobility and achievement when I.Q. was held constant. Many standardized test instruments were used to gather data concerning achievement in various subject matter areas and pupil intelligence, while other instruments including a School Attendance Data Form prepared by the investigator were used to gather data concerning personal characteristics and mobility information. When comparisons were made using ungrouped data, there were no significant relationships between mobility factors and achievement for the sixth grade pupils. Positive relationships between language achievement and the number of schools attended and between achievement and length of time at the present school were found for the ninth grade pupils. When grouped according to personal characteristics, it was found that achievement in arithmetic for sixth grade girls and Blacks was negatively affected by attendance in a large number of schools. The statistical techniques used were analysis of variance and analysis of covariance.

Stiles suggested that the effect of frequent moving upon children may have been grossly exaggerated.(26:467-74) In her study involving grades 1-6, military transient children were chosen as an experimental group and a fairly similar non-transient group was chosen as the control group. On thirty-three of the forty-five tests given, no significant differences were evident. Of the remaining twelve, non-transients did better in ten, whereas the transients excelled in two. It was

pointed out, however, that although the match between the two groups was not perfect, the researchers involved felt that it was near enough to allow for valid results.

Burget(4:163A) found that mobility had very little effect upon the performance of ninth graders, grouped according to mobility and military or civilian, as determined by standard achievement test scores taken from the Iowa Test of Educational Development, Form X4-62. However, students who were classified as permanent civilian achieved significantly higher on general vocabulary than the mobile and semi-mobile groups. Analysis of variance and covariance revealed significant differences within a number of factors and combination of factors, but with further analysis with the use of t-tests, it was found that most of this significance occurred within groups rather than between them. Also, the children of military status parents performed at a significantly higher rate than the children in the civilian groups. There did exist a definite relationship between sex and achievement; girls usually scored significantly higher on the standardized tests than boys.

Several studies involving junior high school students found no significant relationships between mobility and achievement.(11), (17), (10) There was no significant difference between junior high students grouped according to low mobility, high mobility, and stationary in Fouty's study to investigate the effects of mobility and related factors in academic achieve-

ment.(11:3351A) Four variables were selected for use in the final design: sex, mobility, mean parent education, and intelligence. Students were grouped and subgrouped according to frequency distributions for each variable and were then compared using a 2X3X2X3 analysis of variance design. The level of significance was set at .01. As a result, it was concluded that there was no significant difference between the children grouped by the three levels of mobility. Also, there was no interaction between mobility and sex, mobility and mean parent education, or between mobility and intelligence scores.

In order to determine possible relationships of pupil mobility to intelligence quotients, age, and scholastic achievement, Lehman used eighth grade student records, four intelligence tests, and the Metropolitan, California, and Stanford Achievement Tests.(17:3608A) Using computer facilitated research, Lehman concluded that mobility had very little relationship to age, I.Q., or achievement, regardless of the school last attended, birthplace of parents, or the school attendance by state or metropolitan city.

Fitch and Hoffer(10:334-5) matched junior high school students in three categories of mobility — inter-city mobile, intra-city mobile, and inter-intra-city mobile — to determine if there was a significant difference between the academic achievement of mobile students and students who have never moved. The students were matched on age, intelligence, socio-

economic status, grade placement, and sex. Student records and homeroom questionnaires were reviewed to obtain information. Chi-square values indicated that when academic achievement was measured by grades and standardized tests, there was no significant difference between the academic achievement of students who had never moved and students who had moved one or more times.

Several studies involving high school students were consulted by this researcher.(13), (21), (24), (25) The studies, all dealing with mobility and achievement, showed no significant differences between the mobile students and the non-mobile students with regard to academic achievement. Sogbandi's follow-up study, in particular, of the lasting relationship between mobility and achievement, showed no conclusive evidence in support of the extent to which lower achievement in high school was related to mobility in the elementary grades.(25:2780A) The population of this study consisted of randomly selected students in grade 11 who were then classified into two groups:experimental and control. The experimental group was subdivided according to the number of schools attended in grades one through six, and the control group was composed of students who had continuously attended one school. Scores were obtained from the Stanford Achievement Tests, Intermediate II Battery, administered in sixth grade and the Iowa Tests of Educational Development given in grades nine and eleven. Analysis of variance was used for

mobility group scores in grade nine, grade eleven, and grade six. Indication was slight that mobile pupils in elementary grades tended to achieve lower in high school.

Summary

The studies reviewed were all concerned with the relationship between mobility and achievement. An abundant amount of literature was available; this researcher considered only those related studies written after 1959. The studies examined used a multitude of grade levels, a variety of types of data obtained, and employed many combinations of statistical techniques.

The majority of studies reviewed showed that there was no significant relationship between mobility and achievement. Standardized tests were primarily used to obtain achievement scores. The interaction of mobility and other variables such as sex, I.Q., and socio-economic status was observed.(2), (3), (4), (6), (7), (10), (11), (13), (14), (15), (16), (17), (19), (21), (22), (24), (25), (26), (27).

Several studies showed a relationship between mobility and achievement: both positive and negative relationships were examined. However, these relationships existed in specific areas of achievement and for special groups of students.(9), (12), (23), (30).

CHAPTER III

METHODS AND PROCEDURES

Subjects and Selected Methods

Children in the four groups involved in this study were residents of a small town located within twenty-five miles of Phoenix, Arizona, and within ten miles of an Air Force complex. The town was in a transitional stage from being primarily agricultural in nature to suburban. The school district consisted of four elementary schools and one junior high school. The high school was considered in another school district, although administrators were combined for the two districts.

The population of this study consisted of all sixth grade students attending a single school within the school district described. From those 150 students, the sample was chosen of all sixth grade students enrolled and present for the California Achievement Test administered in October, 1973. Five students, although completing the test, were excluded from the analysis because no entrance date to the school was able to be recorded. If a student was present for the testing, but subsequently moved, his scores were still included in the analysis. No random sampling was necessary, since all members of the population, except those absent for the testing or those with no entrance date, were included in the sample. The total number of students in the sample was 132.

The reseacher consulted cumulative records for each student to determine entrance dates. Achievement test scores were obtained from printouts from CTB/McGraw-Hill distributed to the four sixth grade teachers at the school. Students were grouped according to the continuous length of time they were enrolled at the single school, and then scores were recorded for each member of each group. (See Appendix A.) Table I shows the distribution of students within the sample.

TABLE I

SIXTH GRADE SAMPLE BY GROUP

	Total	Male	Female	Black	Spanish Surname	Oriental
Group 1	41	22	19	0	3	0
Group 2	16	7	9	0	1	0
Group 3	40	19	21	0	1	1
Group 4	35	20	15	3	1	0

Group 1 consisted of all students from the sample who were enrolled continuously in the single school as of November 1, 1968. Of the forty-one students, twenty-two were male and nineteen were female; three students had Spanish surnames.

Group 2 consisted of all students from the sample who were continuously enrolled in the single school as of November 1, 1970. Group 2 was composed of sixteen students; seven were male and nine female. One of the students had a Spanish surname.

Group 3 consisted of all students from the sample who were continuously enrolled in the single school as of November 1, 1972. Of the forty students, nineteen were male and twenty-one were female; one student had a Spanish surname, and one student was Oriental.

Group 4 consisted of all students from the sample who were continuously enrolled less than one full year (i.e., after November 1, 1972). Thirty-five students comprised this group. Twenty were male and fifteen were female; three of the students were Black, and one student had a Spanish surname.

Instruments Employed

All achievement test scores were obtained from the California Achievement Tests, 1970 Edition, Level 4 Form A, published by CTB/McGraw-Hill.

> The CAT, 1970 Edition was designed for the measurement, evaluation, and analysis of school achievement. The emphasis is upon content and objectives in the basic curricular areas of reading, mathematics, and language. The intended measurement is one of performance in these curricular areas.(8:5)

The same publishers, CTB/McGraw-Hill, produced the Comprehensive Tests of Basic Skills (CTBS), which is a standardized achievement battery of basic skills, particularly at the elementary school level. One study of the degree of relationship between the similar tests of the California Achievement

Tests and the CTBS yielded correlations as high as .93.(1:20) Most correlations between comparative tests were between .70 and .85.(1:20) Concerning the reliability of the Comprehensive Tests of Basic Skills,

> Typical of basic skills tests, a high degree of reliability exists for subtest scores as well as for total scores. K-R 20 reliability coefficients were usually in the .85 to .95 region, although a few drifted downward as low as .75.(1:20-1)

Thus, it was concluded that the California Achievement Tests was also a reliable instrument.

The California Achievement Tests were scored by machine from the CompuScan answer sheets, CAT/SFTAA Combination. Scores were reported as raw scores, or the number of correct responses, and converted to grade equivalents and percentile ranks. Appendix B shows that the lowest grade equivalent possible was .6, and the highest grade equivalent possible was 13.6.(8:50-1)

Data Collection Methods

The California Achievement Tests were administered to intact classroom groups in October, 1973. The grade equivalent scores were taken from the printouts of results given to each classroom teacher. Entrance dates were obtained from the cumulative records for each student located at the school.

Research Design and Procedures

A causal-comparative design was used for this study with

continuous length of time as the independent variable and mean grade equivalent achievement test scores as the dependent variable. Analysis of variance was used to determine if significant differences existed at the .05 level of significance among the four groups and each of the following subtests of the California Achievement Tests: Reading Vocabulary, Reading Comprehension, Mathematics Computation, and Mathematics Concepts and Problems. Total Reading and Total Mathematics grade equivalents were also compared between groups. The analysis of variance program, ANOVAR, was run on the Univac 1110 six times, each time using grade equivalents for each of the subtests examined. Printouts containing the summary tables were used to interpret results.

CHAPTER IV

ANALYSIS AND RESULTS

The mean scores and f-ratios for each group are presented in Table II.

TABLE II

MEAN GRADE EQUIVALENTS OF SIXTH GRADE STUDENTS BY GROUP

	Group 1	Group 2	Group 3	Group 4	f-ratio
Reading Vocabulary	5.8634	6.5812	6.5300	6.8571	.361
Reading Comprehension	6.5780	6.6000	6.7775	5.6429	1.552
Total Reading	6.1585	6.5312	6.6200	5.5600	1.630
Mathematics Computation	5.4951	5.7625	5.5350	5.2200	.645
Mathematics Concepts and Problems	5.2585	5.7937	5.9075	4.8971	2.230
Total Mathematics	5.4756	5.8562	5.7600	5.1514	1.396

*f-value required at .05 level of significance with 128 degrees of freedom is 2.68

Hypothesis 1 stated that there is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Reading Vocabulary. Hypothesis 1 was accepted since the f-ratio of .361, as shown in Table II, was not sufficient to establish statistical significance at the .05 level.

Hypothesis 2 stated that there is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Reading Comprehension. Hypothesis 2 was accepted since the f-ratio of 1.552 was not sufficient to establish statistical significance at the .05 level.

Hypothesis 3 stated that there is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Total Reading. Hypothesis 3 was accepted since the f-ration of 1.640 was not sufficient to establish statistical significance ant the .05 level.

Concerning mathematics, Hypothesis 4 stated that there is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Mathematics Computation. Hypothesis 4 was accepted since the f-ratio of .645 was not sufficient to establish statistical significance at the .05 level.

Hypothesis 5 stated that there is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Mathematical Concepts and Problems. As seen in Table II, the f-ratio of 2.230 was not sufficient to establish statistical significance at the .05 level; therefore, Hypothesis 5 was accepted.

Hypothesis 6 stated that there is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Total Mathematics. Hypothesis 6 was also accepted since the f-ratio of 1.396 was also not sufficient to establish statistical significance at the .05 level.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Mobility has been considered to have an adverse effect upon pupils' academic achievement. Most school districts measure academic achievement by achievement test scores, and then use the test scores to evaluate various programs within the schools and districts. When achievement tests are administered to students every year, little concern is taken to consider the length of time a student has been enrolled at the school. Evaluations may be improperly made if there is a relationship between the length of time a student has spent at a school and achievement test scores.

The purpose of this study was to establish if a relationship existed between the continuous length of time a sixth grade student attended a single school and reading and arithmetic achievement test scores, as measured by the California Achievement Tests, 1970 Edition, Level 4 Form A, published by CTB/McGraw-Hill, administered in October, 1973.

The hypotheses stated were:

1. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Reading Vocabulary.
2. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Reading Comprehension.

3. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Total Reading.
4. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Mathematics Computation.
5. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Mathematics Concepts and Problems.
6. There is no significant difference between the mean grade equivalents for Groups 1, 2, 3, and 4, in Total Mathematics.

It was assumed that the differences in sex, ability, type of instructional program, chronological age, retentions, sample, and socio-economic status would not significantly affect the results of this study. The distinction between groups was drawn on the basis of enrollment after November 1, 1968. The groups established were:

Group 1 - consists of all sixth grade students who were continuously enrolled as of November 1, 1968;

Group 2 - consists of all sixth grade students who were continuously enrolled as of November 1, 1970;

Group 3 - consists of all sixth grade students who were continuously enrolled as of November 1, 1972;

Group 4 - consists of all sixth grade students who were continuously enrolled less than one full year.

It was stated that the results of this study could not be generalized beyond the population of the study.

The population of the study consisted of all sixth grade students in a single school located within twenty-five miles of Phoenix, Arizona, and within ten miles of an Air Force complex. All students enrolled and present for the California Achievement Test, with a recorded entrance date, composed the sample of 132 students. The sample contained 68 males and 64 females: three students were black, six students has a Spanish surname, and one student was Oriental; the remaining 122 students were Anglos.

The test instrument used was the California Achievement Test, 1970 Edition, Level 4 Form A. This test was administered in October, 1973. Additional information on entrance dates was obtained from cumulative folders of the students located at the school. Test scores were obtained from printouts distributed to each sixth grade teacher.

A causal-comparative design was employed, with continuous length of attendance as the independent variable and achievement test scores as the dependent variable. The statistical technique employed was analysis of variance of mean grade equivalent scores for Reading Vocabulary, Reading Comprehension, Total Reading, Mathematics Computation, Mathematics Concepts and Problems, and Total Mathematics. A .05 level of significance was established.

The findings of this study indicated that all null hypotheses were accepted, since the f-ratios were not sufficient to establish significance at the .05 level.

Conclusions

Since the f-ratios were not sufficient to establish significance at the .05 level, it was concluded that the length of continuous attendance did not significantly affect the reading and arithmetic achievement test scores of the sixth grade students at a single school.

Recommendations

When examining the effect of mobility on achievement, many researchers realized the need of exerting additional controls on variables such as I.Q., sex, and socio-economic background. If measures of these variables would have been available to this researcher, perhaps a better indication of the relationship between the length of continuous attendance and achievement in reading and arithmetic would have been observable.

Although this study and other studies reviewed stated that the results could not be generalized beyond the population, it is helpful to know that the majority of studies revealed no significant differences. Hopefully, the well-adjusted child will always fit into this category. However, problems still exist for many mobile children, although these problems are probably not academic problems. Further research is still needed in the areas of mobility and adjustment.

And, although the conclusions of this study do not differ from other research studies, educators and counselors should

be aware of the problems faced by their mobile students and be ready to help those who have more difficulty adjusting to new school settings.

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APPENDIX A

READING AND ARITHMETIC ACHIEVEMENT TEST SCORES
GRADE EQUIVALENTS

Groupl		READING Vocab.	Compre.	Total	ARITH. Compu.	Con.Pr.	Total
Student	1	2.2	5.4	3.7	6.0	4.9	5.6
	2	5.2	6.7	5.8	5.2	4.9	5.1
	3	5.0	3.5	4.3	6.0	6.8	6.4
	4	7.7	9.5	8.5	7.7	8.2	7.9
	5	7.3	7.6	7.4	6.6	7.0	6.8
	6	9.7	10.6	10.2	6.6	5.2	6.2
	7	6.9	7.6	7.1	6.8	8.2	7.5
	8	5.7	7.9	6.7	5.2	5.5	5.4
	9	4.1	4.4	3.9	3.1	2.6	3.0
	10	8.6	9.8	9.2	6.6	7.8	7.2
	11	5.4	4.4	5.0	4.4	5.5	5.0
	12	8.6	6.2	7.5	6.6	7.0	6.8
	13	7.1	7.0	7.0	6.0	4.2	5.4
	14	9.7	11.7	10.7	7.9	8.4	8.1
	15	5.4	5.1	5.3	6.4	4.6	5.8
	16	4.5	4.8	4.5	4.7	3.0	4.0
	17	2.9	4.8	3.7	2.5	3.4	3.0
	18	5.4	7.9	6.6	7.9	7.4	7.6
	19	5.9	4.8	5.5	4.9	5.2	5.1
	20	7.7	10.0	8.8	6.2	7.4	6.8
	21	5.7	6.2	5.9	5.8	6.2	6.0
	22	2.9	6.7	4.7	5.4	3.4	4.7
	23	5.2	10.0	7.3	4.4	4.2	4.4
	24	4.1	2.9	3.2	3.4	2.6	3.2
	25	5.4	5.7	5.6	4.9	4.6	4.8
	26	4.1	4.0	3.9	4.1	2.6	3.5
	27	6.2	6.2	6.3	5.4	3.7	4.8
	28	2.5	3.5	2.8	4.4	3.0	3.8
	29	7.3	8.4	7.7	4.9	6.8	5.8
	30	5.7	7.9	6.7	6.4	5.5	6.2
	31	1.8	4.8	3.0	4.9	4.2	4.7
	32	8.3	10.0	9.2	6.0	7.8	7.0
	33	6.9	6.7	6.8	4.7	3.4	4.2
	34	5.0	5.7	5.3	4.9	5.5	5.3
	35	4.8	7.0	5.6	4.4	5.2	4.8
	36	5.0	3.5	4.3	4.9	3.7	4.5
	37	7.7	7.9	7.7	6.4	6.2	6.4
	38	6.9	6.2	6.7	6.6	4.9	6.0
	39	5.2	3.5	4.5	4.4	1.9	3.3
	40	9.7	10.9	10.4	6.8	7.8	7.3
	41	5.0	2.3	3.5	4.9	5.2	5.1

APPENDIX A CONTINUED

Group 2		READING Vocab.	READING Compre.	READING Total	ARITH. Compu.	ARITH. Con. Pr.	ARITH. Total
Student	1	11.9	12.9	12.6	8.3	8.6	8.4
	2	7.5	7.9	7.6	7.5	7.4	7.4
	3	5.4	3.2	4.5	3.8	6.5	5.1
	4	4.1	4.4	4.1	5.4	4.6	5.1
	5	10.1	7.3	8.5	6.2	8.6	7.4
	6	9.3	9.8	9.6	8.5	9.3	8.8
	7	4.5	4.4	4.3	6.4	3.4	5.4
	8	5.7	6.7	6.1	3.1	2.6	3.0
	9	3.3	3.2	3.0	2.8	3.4	3.2
	10	2.2	4.8	3.2	4.7	4.2	4.5
	11	2.9	1.7	1.8	6.2	4.6	5.6
	12	5.9	5.7	5.9	6.2	7.2	6.7
	13	9.7	12.9	11.2	6.8	9.0	7.9
	14	8.0	6.7	7.4	5.4	4.2	5.0
	15	8.6	10.0	9.4	7.1	6.8	7.0
	16	6.2	4.0	5.3	3.8	2.3	3.2
Group 3							
Student	1	3.3	4.8	3.9	5.2	6.2	5.6
	2	7.1	4.4	6.1	6.4	5.8	6.3
	3	8.0	7.3	7.6	7.1	7.6	7.3
	4	6.9	8.4	7.5	7.7	7.2	7.4
	5	8.0	4.8	6.8	5.4	4.9	5.3
	6	9.7	9.8	9.8	7.3	8.2	7.7
	7	6.5	7.3	6.8	6.8	6.8	6.8
	8	3.6	4.4	3.9	4.9	4.9	5.0
	9	8.0	8.7	8.3	6.6	7.6	7.1
	10	9.3	10.9	10.2	8.5	9.0	8.7
	11	4.5	7.0	5.5	6.2	5.5	6.0
	12	7.3	6.7	7.0	7.3	7.4	7.3
	13	6.2	7.3	6.7	6.2	5.5	6.0
	14	7.5	7.0	7.3	4.9	7.4	6.2
	15	5.7	3.5	4.9	3.4	2.6	3.2
	16	10.1	11.7	11.0	6.8	6.5	6.7
	17	7.1	8.1	7.5	7.3	6.8	7.1
	18	7.3	9.5	8.2	5.2	5.2	5.3
	19	4.5	4.0	4.1	4.7	4.9	4.8
	20	5.9	6.7	6.3	2.8	4.2	3.5
	21	5.9	4.8	5.5	5.2	6.8	5.9
	22	7.1	7.3	7.1	4.1	6.2	5.1
	23	3.6	4.4	3.9	3.1	2.6	3.0
	24	8.3	8.4	8.3	6.8	8.6	7.7
	25	6.2	9.1	7.4	6.8	8.4	7.6
	26	4.8	4.0	4.3	5.2	5.2	5.3
	27	5.7	4.8	5.3	4.7	4.9	4.8
	28	7.1	5.7	6.7	2.8	3.0	3.0
	29	6.9	6.7	6.8	6.2	7.8	7.1
	30	4.8	6.2	5.3	7.5	6.8	7.1

APPENDIX A CONTINUED

Group 3		Vocab.	READING Compre.	Total	Compu.	ARITH. Con.Pr.	Total
Student	31	8.9	10.6	9.9	7.3	7.4	7.3
	32	9.7	8.1	8.8	5.4	6.2	5.8
	33	5.4	7.0	6.1	4.9	4.6	4.8
	34	5.0	4.4	4.7	5.4	5.2	5.4
	35	1.8	4.8	3.0	3.4	3.4	3.5
	36	6.7	4.8	5.9	3.8	3.7	3.8
	37	7.3	4.4	6.3	4.1	3.7	4.0
	38	5.7	4.8	4.3	3.1	5.2	4.2
	39	6.7	7.6	7.0	4.7	5.2	5.0
	40	7.1	10.9	8.8	6.2	7.2	6.7
Group 4							
Student	1	1.3	2.3	1.3	5.4	3.0	4.5
	2	8.0	7.3	7.6	4.1	3.0	3.6
	3	5.9	3.2	4.9	5.2	6.2	5.6
	4	6.9	4.0	5.8	4.7	3.0	4.0
	5	8.0	6.7	7.4	6.0	4.9	5.6
	6	6.5	6.2	6.5	5.2	5.2	5.3
	7	7.5	9.1	8.2	5.2	6.2	5.6
	8	4.8	5.1	4.9	4.7	5.5	5.1
	9	2.5	5.7	4.1	4.4	3.0	3.8
	10	8.6	9.1	8.8	7.3	7.8	7.5
	11	8.6	11.3	10.1	7.7	7.4	7.5
	12	2.9	2.3	2.2	4.4	4.2	4.4
	13	4.1	4.4	4.1	5.6	3.4	4.8
	14	4.1	5.7	4.9	6.0	6.2	6.2
	15	7.7	7.0	7.4	8.1	7.8	7.9
	16	6.7	7.0	6.8	5.6	5.2	5.5
	17	5.0	3.2	4.1	5.8	4.6	5.4
	18	8.9	9.8	9.4	5.4	5.5	5.5
	19	5.4	5.1	5.3	5.6	6.5	6.0
	20	2.2	5.1	3.5	3.8	3.4	3.6
	21	4.5	4.0	4.1	1.4	2.6	2.3
	22	6.9	5.7	6.6	5.4	5.8	5.6
	23	6.5	6.7	6.6	6.0	5.2	5.8
	24	5.0	4.8	4.9	5.4	3.7	4.8
	25	4.1	2.3	2.8	4.4	3.0	3.8
	26	6.5	2.9	5.0	4.7	7.0	5.8
	27	8.6	7.0	7.7	6.4	7.6	7.1
	28	5.0	5.7	5.3	4.1	3.4	3.8
	29	4.5	3.5	3.9	3.8	3.0	3.5
	30	7.7	7.9	7.7	5.2	7.4	6.3
	31	5.4	6.7	5.9	5.4	5.5	5.5
	32	4.1	4.8	4.3	3.8	1.9	3.0
	33	4.5	3.5	3.9	4.1	4.9	4.5
	34	1.3	4.8	2.8	6.0	2.6	4.8
	35	4.8	7.3	5.8	6.4	5.8	6.3

APPENDIX B

RAW SCORES TO GRADE EQUIVALENTS

(8:50-1)

GE	READING			MATHEMATICS			LANGUAGE				TOTAL BATTERY	GE
	VOCAB	COMPR	TOTAL	COMPU	COMP & PROB	TOTAL	MECH	USAGE	TOTAL	SPELL		
0.6	0-3	0-3	0-10	0-2	0-3	0-4	0-2	0-4	0-12	0-1	0-27	0.6
0.7						5					28	0.7
0.8		4						5	13		29	0.8
0.9			11				3		14		30-31	0.9
1.0						6		6			32	1.0
1.1					4				15		33-34	1.1
1.2								7	16		35	1.2
1.3	4	5	12			7				2	36-37	1.3
1.4				3			4		17		38	1.4
1.5								8	18		39	1.5
1.6			13		5	8					40-41	1.6
1.7		6						9	19		42-43	1.7
1.8	5		14				5		20		44-46	1.8
1.9					6	9		10	21	3	47-48	1.9
2.0		7	15	4			6		22		49-50	2.0
2.1						10			23		51-53	2.1
2.2	6		16					11			54-55	2.2
2.3		8			7	11	7		24	4	56-57	2.3
2.4			17					12	25		58-60	2.4
2.5	7			5		12	8		26		61-62	2.5
2.6		9	18		8				27		63-64	2.6
2.7						13	9	13	28	5	65-67	2.7
2.8			19	6					29		68-69	2.8
2.9	8	10				14	10	14	30		70-72	2.9
3.0			20		9	15			31		73-75	3.0
3.1				7			11			6	76-77	3.1
3.2		11	21			16	12	15	32		78-79	3.2
3.3	9					17			33		80-82	3.3
3.4				8	10		13	16	34		83-84	3.4
3.5		12	22			18	14		35	7	85-87	3.5
3.6	10					19	15		36		88-90	3.6
3.7			23		11		16		37		91-92	3.7
3.8				9		20		17			93	3.8
3.9			24				17		38	8	94-95	3.9
4.0		13				21	18		39		96-97	4.0
4.1	11		25	10			19		40		98-99	4.1
4.2					12	22	20	18			100-101	4.2
4.3			26				21		41	9	102-103	4.3
4.4		14		11		23	22		42		104-105	4.4
4.5	12		27			24	23		43		106-107	4.5
4.6					13		24		44	10	108-109	4.6
4.7			28	12		25	25	19			110-112	4.7
4.8	13	15				26	26		45		113-114	4.8
4.9			29	13	14		27		46		115-117	4.9
5.0	14		30			27	28		47	11	118-119	5.0
5.1		16				28	29	20	48		120-122	5.1
5.2	15		31	14	15		30				123-124	5.2
5.3			32			29	31		49	12	125-127	5.3
5.4	16	17		15		30			50		128-129	5.4
5.5			33		16	31	32		51		130-133	5.5
5.6			34	16		32	33	21	52	13	134	5.6
5.7	17	18									135-136	5.7
5.8			35	17	17	33	34		53		137-139	5.8
5.9	18		36			34			54		140-141	5.9
6.0				18		35					142-143	6.0
6.1			37				35		55	14	144-145	6.1
6.2	19	19		19	18	36		22	56		146-147	6.2
6.3			38			37	36				148-149	6.3
6.4				20		38			57		150-151	6.4
6.5	20		39		19	39			58		152-153	6.5
6.6			40	21		40	37				154-155	6.6
6.7	21	20	41			41		23	59	15	156-158	6.7
6.8			42	22	20	42	38		60		159-161	6.8
6.9	22		43						61		162-164	6.9
7.0		21	44		21	43	39		62	16	165-167	7.0
7.1	23		45	23		44-45					168-169	7.1

APPENDIX B CONTINUED

GE	READING			MATHEMATICS			LANGUAGE				TOTAL BATTERY	GE
	VOCAB	COMPR	TOTAL	COMPU	CONCPT & PROB	TOTAL	MECH	USG & CE	TOTAL	SPELL		
7.2					22	46	40	24	63		170-172	7.2
7.3	24	22	46	24		47			64	17	173-175	7.3
7.4			47		23	48	41		65		176-178	7.4
7.5	25		48	25		49			66		179-182	7.5
7.6		23	49		24	50	42	25	67	18	183-184	7.6
7.7	26		50	26		51					185-187	7.7
7.8					25	52	43		68		188-190	7.8
7.9		24	51	27		53			69	19	191-193	7.9
8.0	27		52		26	54					194-197	8.0
8.1		25		28		55	44		70		198-199	8.1
8.2			53		27	56		26	71		200-202	8.2
8.3	28		54	29		57	45			20	203-205	8.3
8.4		26			28	58			72		206-208	8.4
8.5			55	30		59	46		73		209-211	8.5
8.6	29		56		29	60				21	212-213	8.6
8.7		27		31		61			74		214-215	8.7
8.8			57		30	62	47	27			216-217	8.8
8.9	30			32		63			75		218-220	8.9
9.0			58		31	64			76		221-222	9.0
9.1		28		33		65	48			22	223-224	9.1
9.2			59			66			77		225-226	9.2
9.3	31			34	32	67					227-228	9.3
9.4			60			68	49	28	78		229-230	9.4
9.5		29		35	33	69					231-232	9.5
9.6			61				50		79	23	233-234	9.6
9.7	32			36		70			80		235-236	9.7
9.8		30	62		34	71	51				237-239	9.8
9.9			63					29	81		240-241	9.9
10.0		31		37		72	52		82	24	242-243	10.0
10.1	33		64		35	73			83		244-245	10.1
10.2			65				53				246-247	10.2
10.3		32				74		30	84		248-249	10.3
10.4			66	38	36	75			85	25	250-251	10.4
10.5	34						54				252-253	10.5
10.6		33	67			76			86		254-255	10.6
10.7			68	39	37		55	31			256	10.7
10.8									87		257	10.8
10.9		34								26	258-259	10.9
11.0			69			77					260	11.0
11.1	35						56		88		261	11.1
11.2			70								262	11.2
11.3		35		40	38	78					263	11.3
11.4									89		264	11.4
11.5			71				57				265	11.5
11.6										27	266	11.6
11.7		36				79		32	90		267	11.7
11.8			72								268	11.8
11.9	36											11.9
12.0					39		58				269	12.0
12.1				41							270	12.1
12.2			73			80			91		271	12.2
12.3												12.3
12.4		37									272	12.4
12.5												12.5
12.6			74				59		92		273-274	12.6
12.7						81				28	275	12.7
12.8	37		75		40						276	12.8
12.9		38		42				33	93		277-278	12.9
13.0						82	60				279	13.0
13.1			76						94		280	13.1
13.2											281	13.2
13.3		39	77		41	83	61			29	282-283	13.3
13.4	38			43					95		284	13.4
13.5											285	13.5
13.6	39-40	40-45	78-85	44-48	42-50	84-98	62-72	34-50	96-122	30-32	286-337	13.6